Isolation of Candida norvegensis from Clinical Specimens: Four Case Reports

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DOI: https://doi.org/10.1093/clinids/23.5.1184

stabilized, and his WBC count returned to baseline (1,600/mm^3). One of two blood cultures yielded an anaerobic gram-positive bacillus with terminal spores that was later identified as *C. paraputrificum* (RapID ANA II System, Innovative Diagnostic Systems, Norcross, GA). On identification of the organism (its susceptibility profile was not determined), antibiotic therapy was changed to intravenous metronidazole. Two subsequent sets of blood cultures were negative. The patient again received chemotherapy; however, on 27 August he died of sepsis due to *Staphylococcus epidermidis.*

C. paraputrificum is a gram-positive bacillus that forms terminal spores, is not hemolytic when grown on blood agar plates, and does not produce toxins. *C. paraputrificum* is found in the soil, animal and human feces, and clinical specimens—most notably blood, wounds, peritoneal fluid, and intraabdominal sources [1]. Various dietary factors have been associated with decreased levels of *C. paraputrificum* in fecal microflora (e.g., a high-fiber diet) [2].

Clostridia account for <1%–3% of all blood culture isolates [3, 4] and 4%–11% of all anaerobic blood culture isolates [4, 5]. *C. paraputrificum* accounted for ≤2% of clostridial isolates from all clinical specimens recovered at Indiana University Medical Center from 1979 to 1988 [6]. In reports of clostridial bacteremia, *C. paraputrificum* was the sole blood isolate in two of 12 adults [4] and one of 10 children [7] and in no patients from other series [3, 5]. Fourteen cases of in which *C. paraputrificum* was isolated in blood cultures have been described in the literature. The underlying conditions associated with these cases included gastrointestinal pathology, alcohol abuse, aspiration pneumonia, diabetes mellitus, sickle cell anemia, cyclic neutropenia, and poor nutrition [4, 7–9]. The mortality among patients with sepsis due to this organism is high but may reflect the severity of underlying disease and loss of host defense mechanisms.

Of 39 strains of *C. paraputrificum* reported in *Bergey's Manual of Systematic Bacteriology* [1], 35 were resistant to clindamycin, 13 to erythromycin, 3 to tetracycline, 3 to penicillin, and 1 to chloramphenicol. Six strains were tested by Brazier et al. [10], who found that 4 were resistant to clindamycin and 1 to penicillin, and all 6 were susceptible to erythromycin, tetracycline, chloramphenicol, ampicillin/sulbactam, and metronidazole. No isolates of *C. paraputrificum* in any report were tested against vancomycin.

To our knowledge, this is the first case of *C. paraputrificum* bacteremia reported in a patient with AIDS. The presence of predisposing factors for *C. paraputrificum* bacteremia (gastrointestinal malignancy, neutropenia, and malnutrition), the clinical signs of sepsis temporally related to positive blood cultures, and the clinical improvement with intravenous vancomycin and metronidazole therapy suggest that the organism was a pathogen. Although susceptibility of *C. paraputrificum* to vancomycin has not been reported in the literature, our patient's bacteremia did resolve while he was receiving treatment with this drug.

Acknowledgement

The authors thank Dr. Robert A. Weinstein for his support and suggestions in preparing this manuscript.

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Generalized Infection with *Bartonella henselae* Following Infection Due to Epstein-Barr Virus

Regional lymphadenopathy is the predominant clinical feature of cat-scratch disease (CSD), which is usually preceded by an erythematous papule at the site of inoculation [1]. *Bartonella henselae* has been isolated from lymph nodes of patients with CSD and has been detected by PCR of specimens from these nodes [1, 2]. We describe a patient with general lymphadenopathy who underwent seroconversion to *B. henselae* following an Epstein-Barr virus (EBV) infection.

A 19-year-old man was referred to Cantonal Hospital in Winterthur, Switzerland, on 27 October 1994 with a 4-week history of intermittent high fever, fatigue, nausea, night sweats, and cough as well as a weight loss of 8 kg. His primary care physician had tentatively diagnosed his condition as lymphoma because of a newly detected supraclavicular swelling after an episode of acute mononucleosis in mid-August 1994. On admission to the hospital, the patient looked ill; his temperature was 37.3°C. A left-sided supracla-

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Clinical Infectious Diseases 1996;23:1184–5

1058–4838/96/2305–0045$02.00

vicular tender mass with a diameter of 5–8 cm was noted, and there was a papulomacular erythematous skin lesion (1 cm in diameter) on top of the mass; tender small axillary lymph nodes were also found. The liver was palpable 5 cm subcostally.

The results of laboratory investigations were as follows: erythrocyte sedimentation rate, 80 mm/h; C reactive protein, 60 mg/L; hemoglobin, 13.3 g/dL; WBC count, 15,900/mm^3; platelets, 664,000/mm^3; and alanine aminotransferase, 37 U/L. Serological investigations for HIV, cytomegalovirus, and hepatitis viruses A, B, and C as well as for *Toxoplasma gondii* were negative. IgM to EBV viral capsid antigen was detected. A CT scan revealed the supraclavicular lymph node, generalized abdominal lymphadenopathy with tumors of up to 3.6 cm in diameter, and slight enlargement of liver and spleen. Examination of biopsy specimens from the cervical tumor revealed pus, but cultures of these specimens were negative for bacteria and mycobacteria. Histological examination of the biopsy specimens showed necrotic granulomatous inflammation with giant cells; stains for acid-fast bacteria and argyrophilic bacilli were negative.

Upon specific questioning, the patient remembered having played with a young cat some weeks before the onset of his present illness. CSD was considered in the patient's differential diagnosis. Serology performed as described in previous reports [3, 4] showed an IgG titer of antibodies to *B. henselae* of 1:2,048. *B. henselae*–specific DNA was detected in the tumor biopsy specimen by PCR with use of primers that allow the simultaneous amplification of *B. henselae* and *Bartonella quintana* followed by species-specific hybridization [2].

The patient was treated with clarithromycin (500 mg twice daily for 4 weeks), and he felt well afterwards. Six months later, an abdominal ultrasonogram still showed slight hepatosplenomegaly. IgM to EBV viral capsid antigen was no longer detected, and the titer of IgG to *B. henselae* was 1:512. IgG seroconversion to *B. henselae* and to nuclear antigen of EBV was documented. The first serum specimen (obtained 20 August 1994) revealed an already positive titer of IgG to EBV viral capsid antigen (table 1).

Table 1. Reciprocal titers to *Bartonella henselae* and Epstein-Barr virus in a patient who presented with general lymphadenopathy.

Date of serum specimen	IgG to EBV VCA	IgG to EBNA	IgG to *B. henselae*
08/20/94	640	<10	<64
10/21/94	1,280	<10	1,024
11/09/94	1,280	10	2,048
05/04/95	2,560	>10	512

NOTE. EBNA = Epstein-Barr virus nuclear antigen; EBV VCA = Epstein-Barr virus viral capsid antigen.

This case emphasizes that CSD may be a severe systemic disease and demonstrates that generalized lymphadenopathy should be carefully investigated. EBV infection may have been reactivated by *B. henselae* or EBV may have promoted dissemination of *B. henselae,* which led to our patient's severe illness. Because of the lack of controlled therapeutic trials, it is not known whether antibiotic treatment of immunocompetent patients with CSD is beneficial. Spontaneous resolution of CSD in immunocompetent persons is common, but treatment is indicated for immunocompromised persons and may be indicated for immunocompetent persons with systemic CSD.

Acknowledgment

The authors thank Dr. W. Strupler for data collection and Dr. R. Geertsen and D. Goldenberger for technical help.

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In recent years, we have seen a greater number of previously unusual yeasts isolated from patient specimens; this circumstance corresponds to the increasing population of immunocompromised patients [1–3]. *Candida norvegensis* was originally isolated in 1954 by Dietrichson [3a] and was later described by other investigators [4]. We searched the world literature and found a single case report of invasive disease due to *C. norvegensis* [5]. We describe four seriously ill patients from whom *C. norvegensis* was isolated; two of these patients had AIDS. To our knowledge, *C. norvegensis* infection has not previously been reported among patients with AIDS.

Patient 1. A 31-year-old HIV-infected man with a history of *Pneumocystis carinii* pneumonia (PCP) and Kaposi's sarcoma had oropharyngeal candidiasis (OPC), which was treated with fluconazole. He developed cytomegalovirus esophagitis and probable PCP when his CD4 cell count was 12×10^6/L. He had another episode of OPC that responded to fluconazole therapy, but his respiratory symptoms persisted, and *C. norvegensis* was isolated

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Clinical Infectious Diseases 1996;23:1185–7

1058–4838/96/2305–0046$02.00